Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A portable data storage device including:

a data interface[[ ]] for transferring data into and out of the device,

an interface controller[[ ]],

a master control unit[[ ]], and

at least two NAND flash memory units connected to transfer data to and from the master control unit via respective buses[[ ]],

the interface controller[[ ]] being arranged to send data received through the interface to the master control unit[[ ]], and

the master control unit[[ ]] being arranged:

to partition data packets received from the interface controller[[ ]] into data packet portions;

to transmit different ones of the data portions to each of the NAND flash memory units simultaneously using the respective data buses; and

to control the NAND flash memory units using control signals which are sent to both the NAND flash memory units, the master control unit transmitting at least chip ENABLE signals to both the NAND flash memory units while transmitting the data portions using the buses,

wherein the master control unit is further arranged to transmit a signal simultaneously to the at least two NAND flash memory units which causes the erasure of a section of ~~the~~ memory space of each of the at least two NAND flash memory units.

2. (Currently Amended) ~~A~~ The device according to claim 1 in which the NAND flash memory units are arranged to transmit simultaneously to the master control unit data packet portions, the master control unit being arranged to combine them to form data packets, and transmit the data packets to the interface controller for transmission through the interface controller.

3. (Currently Amended) ~~A~~ The device according to claim 1 in which there are two NAND flash memory units, and the master control unit is arranged to divide the data packets into data packet portions such that each word of the data to be stored is divided into two bytes which are included in data packet portions for different ones of the NAND flash memory units.

4. (Currently Amended) ~~A~~ The device according to claim 1 in which the master control units sends identical control signals simultaneously to both the NAND flash memory units through pins of the master control unit which are each electrically connected to a control signal line, each control signal line leading to respective control signal inputs of the each of the NAND flash memory units.

5. (Currently Amended) ~~A~~ The device according to claim 4 in which the master control unit transmits identical WRITE, READ, ENABLE and ALE signals to the respective NAND flash memory ~~devices~~ units.

6. (Currently Amended) ~~A~~ The device according to claim 1 in which the interface is a USB interface, and the interface controller is a USB controller.

7. (Currently Amended) ~~A~~ The device according to claim 6 in which the interface operates according to a USB standard in having a data transfer rate of at least 480Mbits/s.

8. (Currently Amended) ~~A~~ The device according to claim 1 in which the respective ~~parallel~~ data buses are 8-bit buses.

9. (Currently Amended) ~~A~~ The device according to claim 1 in which each of the data packets has a predetermined size of 512 bytes.

10. (Currently Amended) ~~A~~ The device according to claim 1 in which the master control unit is operative, before transmitting the signal to each of the NAND flash memory units which causes them to erase a section of their respective memory spaces, to instruct each NAND flash memory unit to transfer a portion of the data stored in that section of the memory space to a different location.

11. (Currently Amended) ~~A~~ The device according to claim 10 in which the different location is in a RAM memory.

12. (Currently Amended) ~~A~~ The device according to claim 10 in which the different location is in a location in the respective memory spaces outside the section which is to be erased.

13. (Currently Amended) A method of storing data in a portable data storage device including a data interface for transferring data into and out of the device, an interface controller, a master control unit having a cache memory, and at least two NAND flash memory units, the method including the steps of:

the interface controller sending data packets received through the interface to the master control unit,

the master control unit partitioning the data packets received from the interface controller into data packet portions, and transmitting different ones of the data packet portions simultaneously to each of the NAND flash memory units simultaneously through different respective buses, and controlling the NAND flash memory units using control signals which are sent to both the NAND flash memory units, the master control

unit transmitting WRITE instructions and chip ENABLE control signals to both the NAND flash memory units, and subsequently, while still sending the chip ENABLE control signals, transmitting the data packet portions to the respective NAND flash memory units using the respective buses,

the respective flash memory units storing the data packet portions,

wherein the method further includes the step of the master control unit transmitting a signal simultaneously to the at least two NAND flash memory units which causes the erasure of a section of ~~the~~ memory space of each of the at least two NAND flash memory units.

14. (Currently Amended) A The method of claim 13 and further being a method of retrieving data from a portable data storage device, the method including the steps of:

the master control unit issuing simultaneously to the flash memory units respective READ instructions and chip ENABLE signals;

the flash memory units in response to the READ instructions, and while still receiving the chip ENABLE control signals, transmitting simultaneously the data to the master control unit through different respective buses;

the master control unit combining the data received from the flash memory units for form data packets and transmitting the data packets to the interface controller; and

the interface controller sending data packets received from the master control unit out of the device through the data interface.